

Two Tower Center Blvd.
10th Floor
East Brunswick, New Jersey 08816


CHEMICAL LAND HOLDINGS, INC.

November 29, 2000

U.S. Environmental Protection Agency, Region II
Emergency and Remedial Response Division
290 Broadway, 19th Floor, Room W-20
New York, NY 10007-1866

Attention: Ms. Janet Conetta
Strategic Integration Manager

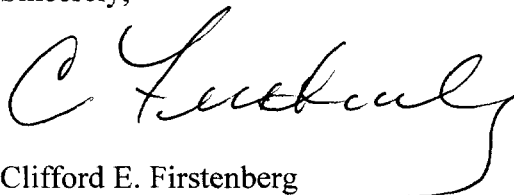
Subject: Meeting Notes – ENDESCO *et al*
Passaic River Study Area
Administrative Order on Consent Index No. II-CERCLA-0117

Dear Ms. Conetta:

Please find enclosed notes of the meeting between representatives of the United States Environmental Protection Agency (EPA), ENDESCO, Brookhaven National Laboratory, and Chemical Land Holdings, held on November 14, 2000 at EPA's office in New York, NY.

Per discussions at the conclusion of the meeting, I am sending copies of these notes to Eric Stern (EPA) and Mike Mensinger (ENDESCO) for distribution among their respective teams.

Sincerely,



Clifford E. Firstenberg
Project Manager
On behalf of Occidental Chemical Corporation
(as successor to Diamond Shamrock Chemicals Company)

enclosure

(2 copies sent)

Copy to:

E. Stern (EPA)
M. Mensinger (ENDESCO)

834010001

J. Conetta
Meeting Notes – ENDESCO *et al*
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- 2c: Section Chief
NJDEP-Bureau of Federal Case Management
401 East State Street - CN 028
Trenton, NJ 08625-0028
Attn: Jonathan D. Berg
- 1c: Chief, New Jersey Superfund Branch
Office of Regional Counsel
U.S. Environmental Protection Agency
290 Broadway, 19th Floor, Room W-20
New York, NY 10007-1866
Attention: Diamond Alkali Site Attorney - Passaic River Study Area

MEETING NOTES
ENDESCO (IGT/Cement Lock) – Initial Meeting
EPA Region 2
November 14, 2000
1 PM

Attendees

Chemical Land Holdings

C. Firstenberg (CLH)
R. Romagnoli (Consultant)
M. Skaggs (Consultant)
T. Wolfskill (Consultant)

U.S. EPA

S. Jaffess (USEPA- Region 2)
E. Stern (USEPA- Region 2)
K. Jones (BNL)
M. Mensinger (ENDESCO)
A. Rehmat (ENDESCO Clean Harbors)
B. Harty (ENDESCO)

Preliminaries

Everyone introduced themselves and their roles.

The difference between Institute for Gas Technology, Gas Research Institute, and Gas Technology Institute was discussed.

Meeting Notes

The ENDESCO team described the IGT/CementLock technology and process - fundamentally a combustion process that destroys organics and vitrifies metals (aided by additives), and then coupled with a chemical process to make cement to immobilize the vitrified metals and create a beneficial-use end product. The end product of the combustion is a product called Ecomelt. The Ecomelt is ground and blended with unidentified "modifiers" to create a cement-like product. ENDESCO showed vials of Ecomelt (small, black, rod-shaped pieces) and ground cement (looks like standard Portland cement).

ENDESCO has treated river sediments from the Detroit River. They have also successfully treated PCB surrogates at 1% concentration, coal fly-ash, and military-type contaminants. All have met TCLP as well as ASTM standards for cement.

ENDESCO is currently working with EPA, NJMR, and BNL under the WRDA-funded evaluation/testing of decontamination technologies. They are currently preparing to treat 350 tons of dredged material from the Stratus Petroleum site (stored in 20 roll-offs). They will be bringing the equipment to the Koppers site as soon as possible after resolving outstanding legal issues.

Anderson 2000 in Peachtree, GA manufactures the rotary kiln (10' diameter, 30' long). It is a 30,000 yds³/year system (already under contract for construction).

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The treatment process is "very forgiving" regarding feed and additives, since the batch is melted anyway. This has been demonstrated by TCLP tests run on the cement powder (which includes the ground Ecomelt plus additives).

ENDESCO's demonstration project was conducted on sediments with 60% water by volume, fed at 100 pounds per hour. The plan was to dry the sediment prior to treatment, but due to technical problems, the wet sediment was processed and the water was vaporized. The only impact to the process was the fuel cost.

The larger scale demonstration project scheduled for 2000/2001 will be permitted as a manufacturing facility. Thus, it will not be required to meet the standards of a treatment facility. EPA hopes to be able to complete the permitting process with only an Environmental Assessment, and not need to prepare an Environmental Impact Statement (per NEPA requirements).

The following characteristics were compared between the ENDESCO process and a typical cement kiln incinerator:

	Incinerator	ENDESCO
Operating temperature	1400 - 1800 degrees C	2500 - 2600 degree C
Residence time	shorter	longer
Feedstock caloric input	required	not required
Air emissions	may generate dioxin	no dioxin generated due to temperature and rapid quench
End product	ash (waste product)	cement (beneficial)

The modifiers used by ENDESCO are typical cement manufacturing materials. They add the required properties and bind-up the metals.

Local residents do not typically support cement kiln incinerators that process hazardous waste. However, Newark-area residents are supportive, so far, due to efforts on community outreach. ENDESCO met with Clean Ocean Action, and they seemed very supportive of the technology. This issue will be more fully tested when EPA/ENDESCO begin working to site the 30,000 yds³/year facility. In addition, this will test the desired permitting process.

General discussion of chemistry and performance during tests:

- Ground Ecomelt has pH = 7
- Cement powder has pH = 12
- ENDESCO has not considered hexavalent chromium (produced by heating trivalent chromium to 2000 degrees C). Keith Jones thinks that BNL may have measured this,

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but only by a surface scanning microscopy method and not by EPA extraction method SW 846 Method 7196A.

- The process generates 120 gallons/minute for the 30,000 yds³/year facility, resulting from flue gas quenching and Ecomelt quenching.
- No wastewater is produced (all is recycled through system).
- The large-scale facility will need to dry sediment before processing to save energy costs.

The group discussed additional testing that CLH may need to conduct under CERCLA.

- ENDESCO can presently conduct additional bench scale tests at one of three facilities (IGT, Chicago; Portland Cement Association, Chicago; other testing facility, California). Minimum volume required is 1 gallon.
- Pilot scale tests can presently be conducted in Denver, CO. Would need to conduct Pilot-scale to be able to test gas emissions. Minimum volume required is 1 ton.

Costs were discussed, especially the lack of cost calculations in the two documents submitted by ENDESCO. ENDESCO claimed that they can treat sediment, regardless of contaminant concentration or variability for ~\$35 per yd³. This includes shore-side handling, screening, and dewatering. Carbon concentration can actually reduce costs due to added caloric value. Other assumptions include:

- The as-dredged sediment weighs 77 pounds per ft³
- Includes cost recovery of selling cement end product at \$60 - \$100 per ton
- Based on 500,000 yds³/year facility

The basis for the \$35 per yd³ cost is sediment with 60% water. The Newton Creek sediments from the first demonstration test ranged from 50 - 70% water content. CLH explained that Passaic sediments range from 50% to almost 100%. ENDESCO indicated that their cost estimate does not include handling or permitting of water that drains from the sediment during drying, nor from runoff.

The economic analyses presented by ENDESCO at the PIANC conference in Oakland, CA were discussed. ENDESCO agreed to provide copies of theses calculations and other economic analyses.

CLH explained requirements under CERCLA regarding Work Plan, QAPP, etc., and asked ENDESCO about similar planning/documents for the tests conducted to-date. ENDESCO agreed to send all pertinent documents such as the NJMR scope of work. They will also send permitting documents from work conducted in Michigan. BNL has their QAPP and laboratory procedures documents.

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Operational issues:

- ENDESCO would want 6 months of sediment backlog to guarantee continuous operation.
- The process can handle 30% - 100% silica without changing the modifiers.
- Mercury and arsenic are the only "problem" chemicals that affect operations.
- Discussed impact of phosphorus and sulfur on the process.
- Lime, alumina, and silica are the most problematic for the kiln itself.
- Salt is a problem for the refractory - vaporizes at 2500 degrees C
- Turn-down ratio is 5:1
- Water content most affects efficiencies

ENDESCO asked about the sequence/schedule of CLH's CERCLA process. EPA responded that it is not appropriate to discuss schedule; for example, there is a Congressional initiative for restoration that could affect the schedule. However, the sequence of the process was presented.

In addition to describing the CERCLA tasks, EPA explained that we need better data than available in the literature to screen-down from ~200 technologies to several that will undergo detailed testing. During this discussion, EPA explained that sediment is not a listed, hazardous waste according to EPA Headquarters.

Action Items

- ENDESCO will provide additional technical papers, work plans, QAPP, etc., and technical information
- ENDESCO will provide economics, including slides presented at PIANC last May
- CLH will prepare and submit Meeting Notes.

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